New Jersey Department of Transportation
QUALITY IMPROVEMENT ADVISORY

QUALITY MANAGEMENT SERVICES

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QIA No. QIA025

Approved: B. Strizki
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Subject: Use of Open Graded Surface Course

Process Affected:
☒Scope ☒Design ☐Right of Way ☐Utilities ☒Environmental ☐Historic ☒Construction

Bureaus Affected:
Designers, Civil Engineering, Environmental, Scoping, Materials and Construction

Procedure(s) Affected:
New Procedure to be developed

Nature of Issue(s):

With increased emphasis on the safety of the motoring public and a greater awareness of how NJDOT construction contracts affect local communities, designers are required to explore more innovative measures that can be utilized to address substandard and undesirable conditions.

One of the challenges faced by the Department is how to provide improved methods for draining the surface of pavements in order to maintain good frictional tire/pavement characteristics on limited access highways. Surface drainage plays an important role in skid resistance, hydroplaning and the amount of splash and spray created by vehicle tires.

Recommendation(s):

A possible means to address the conditions that are attributable to wet weather conditions, is the use of an open graded surface course as a riding surface for vehicular traffic. Use of this type of porous asphalt pavement affords the benefit of reduced tire spray and greatly reduced potential for hydroplaning due to a reduced thickness of the water film on the pavement's surface. These types of pavements also improve wet weather visibility of painted pavement markings at night, which could decrease the occurrences of nighttime wet weather accidents. This could prove to be a cost-effective means of providing a benefit to the local community.

Designers should consider recommending the use of an open graded surface course as early in the design phase as practical whenever one or a combination of the following conditions exist on limited access highways (e.g. Freeways/Interstates) and it is not feasible to construct more costly alternatives:

- **Existing roadway has been identified to have poor drainage due to inadequate cross slopes, etc.**
- **Existing roadway has a high record of wet weather accidents**
- **Reduction in tire spray is sought in areas with heavy truck traffic**
- **The existing pavement profile can be increased by no more than one inch**
- **A smoother riding quality is sought (open graded mixes tend to be smoother than dense graded mixes)**
- **Existing pavement shows beginning signs of premature rutting conditions (open graded mixes increase the pavement temperature dissipation)**

It should be noted however, that open graded mixes do not add structural value to the pavement. So adequate pavement structure in the underlying pavement must exist before consideration can be given to using this type of mix.

For Capital Program Management and Maintenance projects, the Pavement Design Section of the Geometric Design Unit, in conjunction with the Bureau of Environmental Services, shall specify or approve the use of open graded pavement mixes as necessary. In specifying and constructing this type of mix, consideration should be given to the placement temperature sensitivity, which is due in part to the presence of polymer-modified asphalt and the thinness of the lift being placed.

A Pavement Design Procedure Manual is currently under development. The Pavement Design Section will incorporate these guidelines into this manual when it is completed.

Implementation: Immediately

Impact Assessment:	**Cost Impact:**

☐Schedule ☐Quality ☒Cost ☐Scope	**Approximately $45-$50/MG**